



الهيئة العربية للطيران المدني

WORKSHOP INVITATION
Opportunities of Satellite Navigation for Arabic countries
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ACAC GNSS ACTIVITIES

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Part (a)

ACAC Organizational Structure



ACAC Organizational Structure

- Arab Civil Aviation Commission (ACAC) is an Arabic specialized organization related to Arab League, and has been established in 1996.
- Its objectives:
 - To provide CAAs of Arabic States with a common framework to achieve the development and safety
 - To achieve cooperation and coordination between the member states in the field of Civil Aviation
 - To develop and upgrade the Arabic Civil Aviation to fulfill the requirements of the Arabic States in a safe and regular air transport



ACAC Organizational Structure

1- ACAC General Assembly

2- ACAC Executive Council

Director General of ACAC

1- Air Navigation committee

2- Air Transport Committee

3- Air Safety Committee

4- Air Security Committee



ACAC member states

- Jordan
- UAE
- Kingdom of Bahrain
- Tunis
- Algeria
- Sudan
- Iraq
- Palestinian Authority
- Lebanon
- Kuwait
- Egypt
- Morocco
- Mauritania
- Yemen
- Saudi Arabia
- Oman
- Syria
- Qatar
- Libya



ACAC Strategy in the field of Air Navigation

Air Navigation Strategy of ACAC aims to support the ACAC members States to provide ATS services adopted by the criteria of ICAO, to implement its regional and global plans to achieve Air Navigation with high efficiency and activity

ACAC Air Navigation Strategy depends on the following basis:

- 1- Implementation of Air Navigation Services**
- 2- Improving Air Navigation level of Safety**
- 3- Human Resources**
- 4- Cooperation and coordination between ACAC member states**
- 5- Cooperation on the regional and Global level**



Current Main activities in the Air Navigation Committee

- 1- IFPS project**
- 2- ATFM U**
- 3- Arab Control**
- 4- ACAC FANS 1/A Implementation Group (AFIG)**
- 5- NAVISAT**
- 6- GNSS**



Part (b)

Global Navigation Satellite System GNSS



Global Navigation Satellite Systems (GNSS)

- 1) **The first implementation of GNSS in ACAC area is the GNSS 1, which includes GPS constellation**
 - **GPS is used in the En-route phase of flight in ACAC states, and also in the Terminal areas through the implementation of RNAV GNSS Procedures (NPA)**
 - **GPS alone can not meet the ICAO requirements (Integrity, availability, and continuity of service), without system augmentation.**
 - **Due to the geographical close of ACAC area to the European community. EGNOS is dedicated system augmentation required for certain performance.**
 - **EGNOS is the European SBAS**



ACAC Policy Context

- The policy context for the GNSS service implementation over ACAC is being developed around the following major axes:
 - International Civil Aviation Organisation (ICAO) GNSS policy
 - The Euro-Mediterranean Partnership
 - European and ACAC GNSS strategy



Actors

- **Europe**
 - **European Commission (EC), European Space Agency (ESA), and GNSS Supervisory Authority (GSA)**
- **ACAC**
 - **institutional side: ACAC**
 - **operational application side: ACAC ANSPs, airlines, aircraft operators.**
- **ICAO**
 - **APIRG and MIDANPIRG**



Achievements

- **Flight trials, demonstrations and awareness actions**
 - **Performed at Cairo airport (October 2002)**
 - **Three EGNOS Test Reference Stations installed in Cairo (Egypt), Jeddah (Saudi Arabia) and Manama (Bahrain)**
 - **Trials demonstrated clear benefits for all civil aviation users and have forged the ICAO MID decision process**
- **Galileo Euro-Med cooperation Office (GEMCO)**
 - **Inauguration in NANSIC - Cairo, Egypt (September 2004)**
- **METIS Project (2006 – 2009)**
 - **To perform a GNSS regional Plan, Training / Awareness, GNSS Service Demonstration and GNSS Signal In Space Provision (delegated to ESA).**
- **ACAC Regional GNSS – Steering Group (ARG SG)**
- **SIRAJ Project, in the very near future (2010/2011)**
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ICAO

- ICAO APIRG 14 meeting conclusions (2003):
 - a "GNSS SBAS Operational system be implemented in Africa as an extension of EGNOS, starting with the deployment of a pre-operational system", which confirmed at APIRG 15 (2005) by con. 15/20, to prepare EGNOS implementation, numerous activities must be carried out: final system definition, specifications development, cost-benefit analyses and funding.
- ICAO MIDANPIRG/11 adopted *Con. 11/67: STRATEGY FOR THE IMPLEMENTATION OF GNSS IN THE MID REGION*
 - *That, the Strategy for implementation of GNSS aligned with PBN in the MID Region.*



ICAO supports PBN and APV deployment

ICAO 36th General Assembly Resolution 31/1:

- **Implementation of RNAV and RNP operations for Enroute and Terminal Areas**
- **Implementation of approach procedures with vertical guidance (APV) (Baro-VNAV and/or augmented GNSS) for all instrument runway ends, either as primary approach or as a back-up to precision approaches by 2016 with intermediate milestones:**
 - **30% in 2010**
 - **70% in 2014**



ICAO has developed a Performance Based Navigation concept

- PBN is a framework for defining navigation performance requirements (embodied in “navigation specifications”) that can be applied to an air traffic route, instrument procedure, or defined airspace
- PBN includes both Area Navigation (RNAV) and Required Navigation Performance (RNP) specifications.



ARG Areas

For EGNOS extension in ACAC area. ESA has classified the ACAC area into 3 regions:

- 1) ARG 1: ACAC MEDA countries (Morocco, Algeria, Tunisia, Libya, Egypt, Syria, Jordan, Lebanon)**
- 2) ARG 2: ACAC AFI countries and not MEDA (Mauritania, Somalia, Sudan, Djibouti)**
- 3) ARG 3: ACAC Middle East countries (Bahrain, KSA, Qatar, Oman, UAE, Yemen, Kuwait, Iraq)**



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ACAC Regional GNSS (ARG)

For EGNOS extension in ACAC area. ESA has classified the ACAC area into 3 regions, as Follows:

ARG-1 area: has already covered by the European and/or MEDA programme. It is a homogenous extension to EGNOS Europe (Morocco, Algeria, Tunisia, Libya, Egypt, Syria, Jordan, Lebanon)

ARG-2 area: will be covered by other EGNOS extension activity (Mauritania, Somalia, Sudan, Djibouti)

**ARG-3 area: has created a ARG-SG to review the technical feasibility study of EGNOS extension into ARG-3, including the institutional aspects and the financial costs.
(Bahrain, KSA, Qatar, Oman, UAE, Yemen, Kuwait, Iraq)**



Part (c)

Conclusions



Part (c)

Conclusions

1- Technically:

Agreements to be established between European entities and ACAC region on the different technical extension possibilities of EGNOS Service in whole ACAC Area.

2- Institutionally:

European and ACAC partners jointly define, identify and assess different options for the implementation of the institutional framework:

- **Service provision and system operations.**
- **Investment and ownership**
- **Legal aspects (regulatory, liabilities, certification)**
- **...etc**



Thank you

Q & A